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CLAIMS

1. Optical amplification and coupling device of the multimode interference type, the device comprising at least one segment of a multimode wave guide containing an amplifying material to amplify light that propagates in it, characterized in that the amplifying material is contained in a first part of the guide segment in which the light is spatially deconcentrated, a second part of the guide segment in which light is concentrated and which continues beyond the end of the first part being made of a transparent material.

2. Amplification and coupling device according to claim 1, the first and second parts being separated by an interference (6) curved inwards.

3. Amplification and coupling device according to claim 1, the first and second parts being separated by a «V» interface (6).

4. Amplification and coupling device according to claim 1, the first and second parts being separated by a zigzag interface (6).

5. Amplification and coupling device according to claim 1, the first and second parts being separated by an inclined interface (6) along the path of incoming (8) and outgoing (10) rays.

6. Amplification and coupling device according to claim 1, the first and second parts being placed approximately perpendicular to the path of the incident beam (8) and an outgoing beam (10).

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7. Amplification and coupling device according to any one of the previous claims, a single mode guide being placed at the exit from the second part.

5 8. Amplification and coupling device according to any one of the previous claims, the amplifier material being embedded in an InP substrate.

9. Amplification and coupling device according to any one of claims 1 to 7, the amplifying material being
10 a laser material.

10. Amplification and coupling device according to claim 9, the laser material being an InGaAsP quaternary.

11. Amplification and coupling device according to
15 any one of claims 1 to 7, the amplifying material having quantic wells.

12. Optical amplifier comprising:

- an optical pre-amplifier,
- an amplification and coupling device according to

20 one of claims 1 to 11.

13. Process for amplifying the power of a light source emitting radiation, consisting of placing an amplification and coupling device according to any one of claims 1 to 11, or an optical amplifier according to
25 claim 12, on the path of the said radiation.

14. Process for compensating losses in an optical fiber consisting of placing an amplification and coupling device according to any one of claims 1 to 11,

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or an optical amplifier according to claim 12, in the path of radiation passing through the optical fiber.

15. Process for amplification of wave length multiplexed signals consisting of increasing the output
5 power using an amplification and coupling device according to one of claims 1 to 11 or an optical amplifier according to claim 12.